

- [Grand Howl](#)
- [Games \(205\)](#)
- [Yarns \(32\)](#)
- [Activities \(172\)](#)
- [Crafts \(58\)](#)
- [Songs \(13\)](#)
- [Plays \(4\)](#)
- [Prayers \(10\)](#)
- [Training Aids \(1\)](#)
- [Venues \(6\)](#)
- [Programs \(100\)](#)

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Machine Challenge

Category	Activities
Badge	Machines
Time to allocate (mins)	20
Outcome	Cubs will understand how different simple machines work in practice

	Plank/box
	Toy cars
Resources	Bucket
	Rope
	Stones
	Nuts and Bolts

Cubs to complete the various challenges. They can divide into smaller groups if needed and do each challenge separately.

Lever - Lift the Load

Place a heavy box or bucket on the floor. Give Cubs a broomstick and a wooden block as the fulcrum. They have to lift the load without picking it up. Move the fulcrum closer to and farther from the load so they discover that its position changes how much effort is needed.

Key idea: A lever lets us move a heavy load using less effort.

Examples: seesaw, bottle opener, crowbar, scissors.

Pulley - Rescue the Supplies

Run rope through a pulley or over a pole attached to something secure or even

a tree branch. Cubs lift a bucket containing beanbags or another small weight. If possible, let them first lift the bucket directly and then with the pulley.

Key idea: A pulley changes the direction of the force and can make lifting easier.

Instructions

Inclined Plane - Mountain Supply Run

Place one end of a plank on a chair or sturdy box. Cubs race cars down the ramp. Change the angle to see what effect it has (cars go faster/further if incline is higher).

Key idea: A ramp lets us use less force over a longer distance.

Examples: wheelchair ramp, stairs, loading ramp, slide.

Screw - Up We Go

Give each Cub a large bolt and nut. Race to see who can move the nut from one end to the other. Then show that the thread is essentially an inclined plane wrapped around a cylinder. If you have wood and appropriate supervision, Cubs can also drive a screw into soft wood with a screwdriver. The nut and bolts can be done as a relay race.

Key idea: A screw changes turning movement into movement forwards or backwards.

Examples: screws, jar lids, bolts, light bulbs

Entry written by Sharon Venn of 1st Randburg
